



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/672,128	09/26/2003	Phil Mages	NC34668	6082

7590 01/04/2006

Milan Patel  
c/o Nokia Mobile Phones (Patent Dept.)  
Mail Stop 1-4-755  
6000 Connection Drive  
Irving, TX 75039

EXAMINER

HUANG, WEN WU

ART UNIT	PAPER NUMBER
----------	--------------

2682

DATE MAILED: 01/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/672,128

Applicant(s)

MAGES, PHIL

Examiner

Wen W. Huang

Art Unit

2682

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 September 2005.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-29 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-17 and 19-29 is/are rejected.  
7) ☒ Claim(s) 18 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-3, 26 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Sawchuk (US. 6,272,329).

Regarding **claim 1**, Sawchuk teaches a system that facilitates signal transmission and reception (see Sawchuk, col. 1, lines 48-49), comprising:

- a balanced duplexer (see Sawchuk, fig. 1, components comprising:
  - a first component having at least two filter (see Sawchuk, fig. 1, components 134, 132, 54 and 52) configured to convey signals within a transmission and reception frequency band (see Sawchuk, fig. 4, components 44, 46 and 142); and
  - a second component (see Sawchuk, fig. 1, components 20 and 26) that interfaces the first component to a front-end and a back-end (see Sawchuk, fig. 1, components 36, 32, 34, 16 and 28), the second component providing isolation between the first component and the front and back ends (isolation is provided by reducing leakage path; see Sawchuk, col. 3, lines 29-30).

Regarding **claim 2**, Sawchuk also teaches the system of claim 1, the first component provides concurrent signal transmission and reception (see Sawchuk, col. 1, lines 48-49).

Regarding **claim 3**, Sawchuk further teaches the system of claim 1, the second component comprising two or more couplers (see Sawchuk, col. 4, lines 54-55).

Regarding **claim 26**, Sawchuk teaches a method for receiving signals, comprising:

accepting a signal (see Sawchuk, col. 1, lines 56-57);  
conveying the signal to a balanced duplexer, the signal conveyed through at least one filter of the balanced duplexer (see Sawchuk, col. 2, lines 1-3), and  
isolating the signal from a transmitted signal (see Sawchuk, col. 1, lines 28-30 and col. 3, lines 28-30).

Regarding **claim 28**, Sawchuk also teaches the method of claim 26 wherein the balanced duplexer comprises two filters (see Sawchuk, fig. 1, components 132, 134, 52 and 54).

2. Claims 23-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Epsom et al. (US. 4,490,684; hereinafter "Epsom")

Regarding **claim 23**, Epsom teaches a method for transmitting signals, comprising:

conveying a generated signal to a balanced duplexer (see Epsom, fig. 1, "FROM EXCITER", component 10A), the signal divided into two portions (see Epsom, fig. 1, components 10C and 10D), a first portion with a first signal power transmitted through a first filter of the balanced duplexer (see Epsom, fig. 1, component 20) and a remaining portion transmitted through a second filter, the remaining portion associated with a remaining signal power (see Epsom, fig. 1, component 40);

combining the first portion and second signal portions (see Epsom, fig. 1, component 50) after exited at least one coupler, the combined first portion and second portion forming a final signal; and

transmitting the final signal (see Epsom, fig. 1, "OUTPUT" and component 70).

Regarding **claim 24**, Epsom also teaches the method of claim 23, further comprising employing 3dB hybrid couplers to divide the generated signal (see Epsom, col. 2, lines 49-51), and the 3dB hybrid couplers and obtain the final signal (see Epsom, fig. 1, component 70).

Regarding **claim 25**, Epsom also teaches the method of claim 24, further comprising providing isolation between the 3db hybrid couplers and a signal generating and a transmitting component (see Epsom, col.1, lines 49-52).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 5, 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sawchuk as applied to claim 1 above, and further in view of Politi (US. 6,738,611).

Regarding **claim 5**, Sawchuk teaches the system of claim 1, the second component comprising two couplers (see Sawchuk, col. 3, lines 7-8).

Sawchuk fails to teach that, the second component comprising two 3db hybrid couplers.

Politi teaches that, the second component comprising two 3db hybrid couplers (see Politi, col. 4, line 27, 30 and 38).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teaching of Sawchuk with the teaching of Politi in order to reject or suppress unwanted frequency (see Politi, col. 4, lines 10-11).

Regarding **claim 6**, the combination of Sawchuk and Politi further teaches the system of claim 5, the 3db hybrid couplers comprising a Lange coupler (see Politi, col. 4, lines 31).

Regarding **claim 8**, the combination of Sawchuk and Politi also teaches the system of claim 1 employed within a mobile phone (see Politi, col. 5, lines 56 and 58-59).

4. Claims 9, 14, 17 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sawchuk in view of Nakamura et al (US. 6,747,527) and Beaudin et al (US. 6,710,650).

Regarding **claim 9**, Sawchuk teaches a balanced duplexer, comprising:

- a first filter (see Sawchuk, fig. 1, components 134 and 132);
- a second filter (see Sawchuk, fig. 1, components 52 and 54);
- a first coupler (see Sawchuk, fig. 1, component 20) that interfaces the first and second filters to a processing unit (see Sawchuk, fig. 1, component 36) of a device; and
- a second coupler (see Sawchuk, fig. 1, component 26) that interfaces the first and second filters to an antenna (see Sawchuk, fig. 1, component 28), a detector (see Sawchuk, fig. 1, component 28), the balanced duplexer is employed to facilitate transmitting and receiving signals through the first and second filters (see Sawchuk, col. 1, lines 48-49).

However, Sawchuk fails to teach that comprising:

the first and second filters have a substantially similar input and output;

the first coupler that interfaces the first and second filters to processing unit of a device and the first coupler interfaces a first termination; and

the second coupler that interfaces the first and second filters to an antenna, a detector and the second coupler interfaces a second termination, the balanced duplexer is employed to facilitate transmitting and receiving signals, each signal having a respective signal power, through there first and second filters.

But, Nakamura et al teach that comprising:

the first and second filters have a substantially similar input and output (see Nakamura et al, col. 1, line 66 – col. 2, line 3).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teaching of Sawchuk with the teaching of Nakamura et al in order to provide match impedance between transmitting and receiving paths seen from the couplers and to achieve a balanced duplexer.

The combination of Sawchuk and Nakamura et al fails to teach that further comprising:

the first coupler that interfaces the first and second filters to processing unit of a device and the first coupler interfaces a first termination; and

the second coupler that interfaces the first and second filters to an antenna, a detector and the second coupler interfaces a second termination.

But, Beaudin et al teach that comprising:



the first coupler (see Beaudin et al, fig. 2, component 22) that interfaces the first and second filters to processing unit of a device and the first coupler interfaces a first termination (see Beaudin et al, fig. 2, component 30); and

the second coupler (see Beaudin et al, fig. 2, component 20) that interfaces the first and second filters to an antenna, a detector and the second coupler interfaces a second termination (see Beaudin et al, fig. 2, component 28).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teaching of Sawchuk and Nakamura et al with the teaching of Beaudin et al in order to dissipate in a load components of the signal which are reflected in the input (see Beaudin et al, col. 3, lines 18-20).

Regarding **claim 14**, the combination of Sawchuk, Nakamura et al and Beaudin teaches the system of claim 9, the balanced duplexer inherently buffers an input and an output stage (the first and second couplers inherently act as buffers as the first and second couplers diverting reflected power; see Beaudin et al, col. 3, lines 18-20; fig. 2, components 30 and 28).

Regarding **claim 17**, the combination of Sawchuk, Nakamura et al and Beaudin et al teaches the system of claim 9, the first and second terminations is about 50 Ohms (see Beaudin et al, fig. 2, components 30 and 28).

Regarding **claim 20**, the combination of Sawchuk, Nakamure et al and Beaudin et al teaches the system of claim 9, the first and second couplers divert reflected power into the first and second terminations, respectively (see Beaudin et al, col. 3, lines 18-20; fig. 2, components 30 and 28).

Regarding **claim 21**, the combination of Sawchuk, Nakamure et al and Beaudin et al teaches the system of claim 9, the first and second couplers reduce reflected energy by combining reflected energy that is 180 degrees out of phase (see Beaudin et al, col. 4, lines 31-36).

Regarding **claim 22**, the combination of Sawchuk, Nakamure et al and Beaudin et al teaches the system of claim 9, the first and second filters employed in the reception of a signal (see Sawchuk, fig. 1, components 134, 132, 52 and 54) inherently to improve LNA and antenna matching (when the first and second filters have a substantially similar input and output impedance, the front-end and back-end impedance matching is inherently achieved).

5. Claims 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sawchuk, Nakamure et al and Beaudin et al as applied to claim 9 above, and further in view of Epsom.

Regarding claim 10, the combination of Sawchuk, Nakamure et al and Beaudin et al teaches the balanced duplexer of claim 9.

However, the combination of Sawchuk, Nakamure et al and Beaudin et al fails to teaches that, the first and second filters are employed such that a portion of signal power is directed through one of the filters and the remaining signal power is directed through other filter.

But, Epsom teaches that, the first and second filters are employed such that a portion of signal power is directed through one of the filters (see Epsom, fig. 1, "UPPER PATH") and the remaining signal power is directed through other filter (see Epsom, fig. 1, "LOWER PATH").

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teaching of Sawchuk, Nakamure et al and Beaudin et al with the teaching of Epsom.

Regarding **claim 11**, the combination of Sawchuk, Nakamure et al, Beaudin et al and Epsom also teaches the balanced duplexer of claim 10, the portion of signal power directed to respective filters is determined by a power ratio (see Epsom, col. 4, lines 15-32).

Regarding **claim 12**, the combination of Sawchuk, Nakamure et al, Beaudin et al and Epsom also teaches the balanced duplexer of claim 10, the portion of signal power

directed through respective filters is about one half the total power (see Epsom, col. 4, lines 15-32).

Regarding **claim 13**, the combination of Sawchuk, Nakamure et al, Beaudin et al and Epsom also teaches the balanced duplexer of claim 10, the first and second filters configured such that if one filter becomes inoperable , the other filter can be utilized to process the full signal power (see Epsom, col. 4, lines 15-32).

6. Claims 15, 16 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sawchuk, Nakamure et al and Beaudin et al as applied to claim 9 above, and further in view of Politi.

Regarding **claim 15**, the combination of Sawchuk, Nakamure et al and Beaudin et al teaches the system of claim 9.

However the combination of Sawchuk, Nakamure et al and Beaudin et al fail to teach that the first and second couplers being 3 dB hybrid couplers comprising one of a Lange coupler and a discrete coupler.

But, Politi teaches that the first and second couplers being 3 dB hybrid couplers (see Politi, col. 4, line 27, 30 and 38) comprising a Lange coupler (see Politi, col. 4, lines 31).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teaching of Sawchuk, Nakamure et al and

Beaudin et al with the teaching of Politi in order to reject or suppress unwanted frequency (see Politi, col. 4, lines 10-11).

Regarding **claim 16**, the combination of Sawchuk, Nakamure et al, Beaudin et al and Politi teaches the system of claim 15, the Lange coupler providing isolation between the first and second filters and the processing unit and the first and second filters and the antenna and detector (isolation is provided by reducing leakage path; see Sawchuk, col. 3, lines 29-30).

Regarding **claim 19**, the combination of Sawchuk, Nakamure et al, Beaudin et al and Politi teaches the system of claim 9 employed within a mobile phone (see Politi, col. 5, lines 56 and 58-59).

7. Claim 27 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sawchuk in view of Beaudin et al.

Regarding **claim 27**, Sawchuk teaches a system that facilitates concurrent signal transmission and reception via a balanced duplexer (see Sawchuk, col. 1, lines 48-49), comprising:

means for coupling a generated signal with the balanced duplexer (see Sawchuk, fig. 1, component 20);

means for coupling a received signal with the balanced duplexer (see Sawchuk, fig. 1, component 26);

means for isolating the generated signal from the received signal (see Sawchuk, col. 1, lines 28-30 and col. 3, lines 28-30);

means for filtering the generated and received signals (see Sawchuk, fig. 1, components 132, 134, 52 and 54).

However, Sawchuk fails to teach that further comprising:

means for diverting power reflections associated with the generated and received signals to terminations.

But, Beaudin et al teach that comprising:

means for diverting power reflections associated with the generated and received signals to terminations (see Beaudin et al, fig. 2, components 28 and 30, col. 3, lines 18-20).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teaching of Sawchuk with Beaudin et al in order to dissipate in a load components of the signal which are reflected at the input.

Regarding **claim 29**, the combination of Sawchuk and Beaudin et al also teaches the system of claim 27 wherein the balanced duplexer comprises two filters (see Sawchuk, fig. 1, components 134, 132, 52 and 54).

***Allowable Subject Matter***

8. Claim 18 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding **claim 18**, the combination of Sawchuk, Nakamura et al and Beaudin et al teaches the system of claim 9.

However, the combination of Sawchuk, Nakamura et al and Beaudin et al fail to teach that the first and second filters comprising acoustic filters comprising SAW and BAW filters.

### ***Response to Arguments***

Applicant's arguments filed 9/28/2005 against claims 1-4 and 26 have been fully considered but they are not persuasive.

In response to applicant's argument that Sawchuk fails to teach a balanced duplexer because dedicated paths and additional components are required by Sawchuk, the Examiner disagrees. The Examiner further submits the term "comprising" is inclusive or open-ended and does not exclude any additional and unrecited elements.

In response to applicant's argument that Sawchuk fails to teach a balanced duplexer because the filters of Sawchuk are associated with either reception or transmission and are not capable of acting in both bands, the Examiner disagrees. More

Art Unit: 2682

specifically, the two filters of Sawchuk, one of which is associated with reception while the other one is associated with transmission, are together capable of acting in both bands simultaneously.

Applicant's arguments with respect to claim 23 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.



Art Unit: 2682

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wen W. Huang whose telephone number is (571) 272-7852. The examiner can normally be reached on 10am - 6pm.

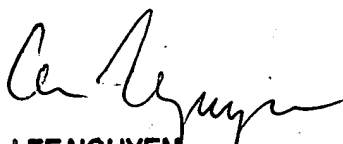
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris H. To can be reached on (571) 272-7629. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

wwh

W

12/12/05

  
**LEE NGUYEN**  
**PRIMARY EXAMINER**